ART. VII.—*Paralysis of the Trigeminus, followed by Sloughing of the Cornea.* By WILLIAM F. NORRIS, M.D., of Philadelphia.

W. McC., aged 42, horse-jockey, came to the clinic of the University of Pennsylvania, September 11, 1871, complaining of an inflammation of the left eye. The patient is pale and emaciated, and has a large epitheliomatous growth at the left angle of the mouth, which he says has existed for several months.

The left eye has been sore only one week, and the conjunctiva now presents a bright red hue, but remains transparent and without granulations. There is slight bulbar chemosis and a punctated keratitis, most marked at the centre of the cornea, which renders it difficult to see the iris except at its periphery. It appears, however, to respond to the stimulus of light, and certainly dilates under atropia.

There is a slight drooping of the eyelid. The eye is mobile in all directions, but has lost its sensibility, and the cornea and conjunctiva may be touched without his evincing any consciousness of it. There is also impaired sensibility both in the skin and mucous membrane of the left side of the nose. The sense of taste seems also impaired, and salt placed on the left side of the tongue is much less promptly recognized than on the right. There is slight paresis of the left facial nerve, and marked deafness on the same side—does not hear a watch on contact, and a tuning-fork held at the vertex is heard only on the right side.

A solution of atropia was instilled into the eye, and a compress bandage applied so as completely to close the lids. This was removed twice daily, to cleanse the eye, and immediately reapplied, to prevent the ingress of dust or other foreign bodies. Notwithstanding these precautions, the inflammation of the cornea progressed, and a small slough formed at its centre, and separated. The minute aperture thus caused was blocked up by the iris, and subsequently showed as a central black spot.

September 20. He for the first time experienced a sensation of dizziness, and found that he could with difficulty walk straight. This feeling, however, soon passed off, and up to date he has driven a pair of horses daily in the park.

October 15. He has been absent from the clinic and confined to the house for the last two weeks, owing to the tumour at the angle of the mouth becoming inflamed and ulcerated. During this interval he has had repeated attacks of dizziness, usually occurring in the afternoon, and causing him to stagger in walking. His gait is now habitually unsteady.

The limbus corneæ above and below has become vascular, and next to it is a comparatively clear rim of corneal tissue, which is separated by a sharply-cut groove from the opaque central portion.

The right eye is healthy and emmetropic, $V=\frac{20}{XX}$.

The eye is more inflamed, and there is marked hypopyon.

20th. There is less inflammation, and the pus in the anterior chamber has been absorbed.

On this day Dr. Garretson removed the epithelioma at the angle of the mouth, and the patient passed from my observation. Through the kindness of the former, I learn that on the 24th and 25th there was violent pain in the head, the patient crying out that "it would kill him." On the 26th the pain was still severe, but was more in the neck and cheek. From this date, although the attacks of pain were much less frequent, and his mind, which had been wandering, became more clear, the patient gradually grew weaker, and on the 21st November died. No autopsy was allowed.

The interest of the above detailed case centres in the fact that, although the patient was seen at an early stage of the inflammation of the cornea, the most sedulous care in cleansing the eye and protecting it from external irritants did not prevent the necrosis and perforation of the central portion of the cornea.

Inasmuch as the views of physiologists as to the influence of the trigeminus in the nutrition of the cornea are so diverse, it may be of interest to recapitulate the results of a few of the more prominent experimenters. Herbert Mayo[1] showed that section of the fifth nerve within the cranium produced insensibility of the eye. Charles Bell[2] recognized the fact that the sensibility of the eyeball was due to the fifth nerve, and maintained, "that when the sensibility is destroyed, although the motions of the eyelids remain, they are not made to close the eye to wash and clean it, and consequently inflammation and destruction of that organ follow." Magendie[3] showed that section of the nerve in rabbits produced anæsthesia of the eye and inflammation and sloughing of the cornea. He, and after him Longet, found that section of the nerve anterior to the ganglion of Gasser was more likely to produce this effect than section posterior to it. The latter[4] attributes the changes which take place in the eye to impaired nutrition, and argues that they cannot be due either to diminished secretion of tears or to the insensibility of the eye, because neither the more complete dryness of the ball after extirpation of the lachrymal gland, nor the prolonged contact of the air in paralysis of the facial nerve, produces the same effects.

Graefe[5] experimented on rabbits, and found that intracranial section of the trigeminus caused insensibility of the ball, and complete opacity of the cornea, which in his experiments never went on to perforation. He maintained that the trigeminus is in part a trophic nerve, and that the destructive changes ensuing in the eye are not alone due to insensibility to external irritants, because extirpation of the tear-gland and cutting off both eyelids do not produce the same effect—the cornea remaining transparent. He also adduces pathological cases (in man) in which perforation of the cornea occurred.

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[1] Anatomical and Physiological Commentaries, London, 1822, No. 2, p. 5.

[2] Nervous System of the Human Body, London, 1830, p. 207.

[3] Journal de Physiologie Expérimentale, tome iv. pp. 176–183, 1824.

[4] Anatomie et Physiologie du Système Nerveux, tome ii. p. 161, Paris, 1842.

[5] Archiv für Ophthalmologie, Band I., Abth. I., s. 306–315.

Snellen[1] cut the trigeminus in rabbits, and found that when he protected the eye, by sewing the yet sensitive ear over it, the cornea remained intact for ten days, but that without this precaution it rapidly clouded. He has since published a case in a middle-aged man, where the eye improved when placed under a stenopaic shell, and the acuity of vision rose from $\frac{20}{CC}$ to $\frac{20}{XX}$. When the protection was removed, it again sank to $\frac{20}{C}$, and immediately improved on its reapplication. He, therefore, argues that the changes in the cornea are traumatic, and not due to any trophic influence of the ganglion of Gasser.

Meissner[2] holds that the inner fibres of the nerve are more important than the outer, for the preservation of the cornea, because, if the nerve be only partially divided and the former left intact, the cornea, although insensible, does not become opaque.

Schiff[3] arrived at much the same conclusions.

Finally, Sinitzin,[4] from experiments on rabbits, advances the following views:—

1. That extirpation of the superior cervical ganglion of the sympathetic caused congestion of the choroid, and increased the temperature of the eye.
2. That the cornea in the operated side became more capable of resisting external irritants.
3. That, after cutting the trigeminus in front of the ganglion of Gasser, neuroparalytic affection of the cornea does not ensue, if the superior cervical ganglion of the sympathetic be at the same time extirpated.
4. That, after such changes have set in, they become retrograde, and disappear after extirpation of the ganglion.
5. That this is possible, so long as the cornea has not become dry and horny, and that even at this period it arrests further destruction.
6. That ulcerations of the lips and lids also disappear, and that, to allow repair to take place, it is not at all necessary to protect the eye.

ART. VIII.—*Climate in its Relations to the Production, Progress, Amelioration, and Cure of Consumption.* By MANNING SIMONS, M.D., of Charleston, S. C.

THE numerous and complex factors which constitute climate have invariably attracted attention in their relation to health and the production

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[1] Virchow's Archiv, 13. Bd., s. 107, 1858.

[2] Henle and Pfeuffer's Zeitschrift (3), xxix. p. 96 (quoted by Wells).

[3] Ibidem, p. 217 (quoted by Wells).

[4] Centralblatt für Medicinischen Wissenschaften, No. 11, March 18, 1871.